Performance Persistence of Fixed Income Funds in Thailand

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Abstract
The objective of this research is to study the operational performance and persistence of fixed income funds in Thailand during 2008 - 2017. The results reveal that the rate of returns of most fixed income funds give the Underperforming for the case of not considering the risk factors and measuring the performance by Sharpe Ratio. However, when considering Risk-adjusted Returns by using the Capital Asset Pricing Model (CAPM), the majority of fixed income funds are found to be able to generate little excessive returns (Alpha) with statistical significance. Besides, in studying the performance persistence of fixed income funds using the Winner-Winner, Winner-loser Persistence Test, the results of this research confirm the results of most researches on foreign fixed income funds that the performance of the Fixed Income Funds has the persistence at low to moderate level. This demonstrates the empirical results that fixed income funds are likely to continue to generate Poor Performance Persistence more than Good Performance Persistence.
Keywords: Fixed Income Funds, Persistence, Performance

Introduction
The current financial markets offer a variety of investment vehicles to meet the needs and investment patterns of individual investors such as equity, debts, derivatives and mutual funds. The fund is another investment option suitable for individual investors with limited direct investment in various securities. The lack of investment expertise or limited capital makes it impossible to invest in many securities resulting in not being able to distribute the investment properly. Or it may be caused by not having time to study the information and keep track on the investment analysis. With these limitations, most retail investors are more likely to invest in mutual funds. The mutual fund is a type of investment project organized by Asset Management Company that raise funds from various investors altogether in large amount through the issuance of Unit trust to be invested in financial markets and assets that do not conflict with the law. The fund manager is responsible for supervising and managing the funds in accordance with the investment policy as specified in the fund prospectus. The investors who invest in a mutual fund will receive the returns on their investment in the form of dividends in accordance with the dividend payment policy and / or in the form of Capital gain/Capital loss.

When considering the attractiveness of investing in mutual funds from the information of Association of Investment Management Companies (AIMC), it is found that the mutual fund has been popular among the investors continually for almost three decades. This can be noticed from the value of assets under the management of the investment management industry. The value was added from 2.61% per GDP in 1992 to 32.58% per GDP in 2017 or calculated as the net asset value of the fund of 63,000 million baht in 1992, 5 trillion baht increasing in 2017.

Especially, the value of investment in Fixed Income Fund, it is found to have a very high growth rate with total net asset value of 61,000 million baht in 2000 and 2.6 trillion baht in 2018 or equivalent to 52.24% of the net asset value of the mutual funds of the whole country.

That means more than half of Thailand's net asset value is invested in Fixed Income Fund. Such numbers are constantly rising. It clearly shows that Fixed Income Fund plays an important role in driving and determining the direction and stability of capital markets and the country's economy. It is the indirect investment tool for low risk investors. The Fixed Income Fund is the fund that has a policy to invest in debt instruments in proportion to the investment policy of the fund such as treasury bills, promissory notes, short-term debentures, government bonds, state enterprise bonds, foreign debts, etc. Bonds are instruments that often provide investors with a consistent level of returns and low default risks compared to other instruments. As the fund is managed by the fund manager who is specialized in the investment and the investment management company is a large financial institute with tools to help analyzing and accessing the information for making the decision in the investment more easily than the retail investors, the retail investors are confident that the fund can manage the investments to generate the good returns sufficiently at the risk levels acceptable by the investors. However, from many foreign researches on the performance of Fixed Income Fund, it reveals that fixed income funds can make returns on investment less than market returns and the fixed income funds cannot maintain the performance persistence in the short and long term (Blake, Elton, & Gruber, 1993; Droms & Walker, 2006; Grose, Dasilas, & Alexakis, 2014).

In studying the efficiency of management of each mutual fund, the operational performance of each fund will depend on the managerial skills such as the managerial skills of selectivity, market timing, and performance persistence of the projects to be higher than the referred standard value, etc. From studying the mutual fund performance which is the result from the management of the fund manager, this is the subject being interested in the study both domestic and international both in the academic study and the study by the institute investors or general investors to be supplementary for the decision making. There are a lot of empirical studies on the performance of mutual fund following the different period and methods of study, for example, Hendricks, Patel and Zeckhauser (1993), Goetzmann & Ibbotson (1994), Brown & Goetzmann (1995), Carhart (1997), Lynch, Wachter and Boudry (2002), Gruber (2011), and Leite & Armada (2017). Although there are many studies on the performance of fixed income fund in many countries around the world including USA, Australia, United Kingdom or even the countries in Asia, China, India, Malaysia, etc. However, the studies on the fixed income fund are not many compared to equity fund, especially in Thailand. Thus, it is interesting to know how the efficiency of performance of fixed income fund management in Thailand is. The study will be beneficial both academically and for the benefits of investors' investment planning as well as a guide for fund managers. Therefore, this research is the starting point for the study of the performance of the fixed income fund in Thailand. This will benefit the industry of mutual fund in Thailand further.

This research has two main objectives. The first objective is to study the performance of fixed income funds in comparison with the benchmark in order to know whether the investment in the fixed income funds can generate the surplus returns compared to the standard value or not. The second objective is to study the persistence of fixed income funds whether it can generate the good returns consistently or not.

Literature Review

Mutual funds play an important role as an investment tool for individual investors and are responsible for managing the investments to the best of their ability and in line with their investment goals and objectives. Therefore, the key factor to be supplementary with the decision making to invest in the mutual fund is the ability to generate returns or the performance of the mutual fund. Various studies related to mutual funds focus on the calculation of the performance of mutual funds. Practically, it will calculate the annual return

obtained from that fund with the risk-adjusted return compared to the returns on the investment as the Benchmark. This is usually the market return or the average return of the mutual fund or the performance of other funds with similar investment policies.

The study of the performance of mutual funds has the major starting point from the study of Treynor (1966), Sharp (1966), and Jensen (1968), which has created the concept for evaluating the performance of mutual funds considering the Risk-adjusted Return. The result of such study is found that the mutual fund can generate lower returns than the expected returns compared to the marketing return used as the standard value. This is consistent with the results of Grinblatt and Titman (1992) and Malkiel (1995) which investigated the efficiency of mutual fund performance by calculating the alpha (α). The alpha is the Abnormal Rate of Return based on the Capital Asset Pricing Model (CAPM) to determine whether the mutual fund can generate additional returns after the adjustment for the risk or not. The results show that mutual funds cannot generate returns after the risk adjustment to win over the market or the performance of the fund Underperforms.

In addition, measuring the consistency of fund performance is an important consideration for most investors. The persistence study is to study whether the funds can perform better (worse) than the overall average of the funds over a period of time and they can still maintain good (bad) performance in the next period or not. In the past, the performance of the fund was tested since 1992 in the study of Grinblatt and Titman (1992), Hendricks et al. (1993), Goetzmann and Ibbotson (1994), and Malkiel (1995). The first and most popularly and frequently referred in the studies was the study of Grinblatt and Titman (1992) that investigated the performance persistence of mutual funds compared to the standard values using the alpha in the comparison. The research results show that funds have the positive persistence and each fund has different performance persistence depending on the fund manager's ability to generate the abnormal returns. However, Hendricks, Patel, and Zeckhauser (1993) have investigated the performance persistence of No-load fund using the alpha compared to the determination of standard value following the method of Grinblatt and Titman (1992), Grinblatt and Titman's eight-portfolio benchmark group. It was found that the performance of the fund was persistent for a short period of 1-8 quarters only. This is the study that supports the phenomenon of "Hot Hand". The phenomenon of Hot Hand is the phenomenon believing that if the funds can create the good performance in the past, the funds can create the good performance in the future.

There are also similar studies related to the measurement of persistence or continuity of the mutual fund performance including Goetamann and Ibbotson (1994), Brown and Goetzmann (1995), Malkiel (1995), and Kahn and Rudd (1995). This is to measure the continuity of performance over time versus the returns of the next period. It is called Winner-Winner, Winner-loser Persistence Test. Overall, the results of the study show that the poor performance of the fund is worse than the Good Performance.

The studies on the performance of fixed income fund specifically are limited compared to equity funds. At the start of the study on the performance of the fixed income fund, Blake, Elton and Gruber (1993) studied the performance of fixed income funds in USA. The instruments used in this study are Single-index models (SIMs) and Multiple-index models (MIMs). This is the study similarly to the study of Gallo, Lockwood, & Swanson (1997). The research results show that the returns of fixed income funds cannot defeat the market either the methods of Single-index benchmark or Multi-index benchmark.

Kahn and Rudd (1995) studied the performance of fixed income funds using the Asset class factor model. The study focused on measuring the performance persistence. In the same way, Droms and Walker (2006) studied the continuity of performance persistence of short-term fixed income funds classified by types of investment in the fixed income funds of public and

private sectors using the method of the winner-winner, winner-loser, gone methodology for a certain period of time. The results are persistent with statistical significance using t-statistics.
Huij and Derwall (2007) studies the continuity of the performance of 3,549 fixed income funds in 1990-2003. The research results revealed that the good (poor) performance of the fund in the past can make the good (bad) returns in the next period. The phenomenon is called "Hot Hands" of the fixed income fund. That is, the performance of mutual funds in the past can predict the performance of mutual funds in the future. On the other hand, Grose, Dasilas and Alexakis (2014) studied the persistence of performance of fixed income funds in public sector in the short term, medium term, and long term using Sharpe's Ratio. The results show the "cold hands" phenomenon in measuring the performance of short-term and medium-term fixed income. Dietze et al. (2009) and Maag and Zimmermann (2000) investigated the performance of fixed income funds in Europe and USA and found that the performance of the fixed income fund was positive non-significantly. Du et al. (2009) studied the efficiency of private equity investment. The results show that fund managers do not have the positive skills in the fund management adequately for making the surplus returns compared to long-term market returns.
In conclusion, the foreign research results studying the performance of fixed income fund were from Elton, Gruber and Blake (1995), Kahn and Rudd (1995), Gallo, Lockwood and Swanson (1997), Detzler (1999), Ferson, Henry and Kisgen (2006). This showed the study results indicating that the fund manager underperforms. The results of studies of Droms and Walker (2006), Grose, Dasilas and Alexakis (2014) are confirmed in term of the performance persistence of the mutual funds that the mutual funds cannot maintain the performance of the funds persistently.
The studies of performance of fixed income funds in Thailand are still limited. Most studies are based on the performance of the equity funds. Sorasat Sukcharoensin and Pariyada Sukcharoensinnatthawut (2013) studied the performance and performance persistence of the equity funds. The study reveals that Thai equity funds can averagely adjust their investment strategies better during the downtrend than in the uptrend and some equity funds can maintain the good performance to be persistent in the short term. However, there are other equity funds that continue to perform poorly. The results of this study are in line with the research conducted by Komwut Wissavaphaisan and Kallayanee Phakkaat (2014). They study the persistence of the return from the long-term on equity funds with active management. The persistence of the fund's rating is measured by using Spearman's ordinal correlative statistics. The research result is found that the fund's ratings in the past year did not clearly indicate that highly rated funds would be able to maintain a steady return in the next year. In addition, Natthawut Jenwitthayaroj (2017) studies the performance and continuity of performance of mutual funds with proactive policy during 1995-2014. It is found that the performance of equity fund on average cannot beat the market returns after the risk adjustment with statistical significance both in long term and short term. The funds that win the market also cannot produce good returns in the future with statistical significance both in short term and long term. For the study in Thailand, no study is found on the persistence of fixed income funds.
According to the above studies, no study is found on the performance of fixed income fund in terms of performance persistence. It is interesting that the performance of the fixed income fund in Thailand will be persistence or not. This is to increase the empirical data on how fixed income funds in Thailand have the performance compared to foreign research.

Research Methodology

This research studies the performance and the performance persistence of fixed income funds in Thailand in the type of Open-end Fund and the dividend is not paid with the investment policy in the fixed income funds in medium and long terms following the fund groups

classified by the Securities and Exchange Commission (SEC) consisting of Long term General Bond Fund and Midterm General Bond Fund for 54 to 136 funds during 2008 to 2017 excluding the Money Market Fund, general short term bond fund and government short term bond fund referred to the method of Blake et al. (1993). In this study, the consideration will be done only for the funds with the operation in 2008 and the funds must be actively manage funds in 2017. The funds having been cancelled previously will not be considered.

This study uses the Benchmark to compare to the returns of the funds already adjusted the risks for measuring the performance of the fixed income funds. The data used in this study is the daily secondary data from the website to be operated via mutual fund in order to collect the data of Net Asset Value (NAV) and calculate the annual returns of the mutual fund following the method of calculation of Geometric Return. The data is collected following the Benchmark in the calculation consisting of ThaiBMA Government Bond Total return Index, ThaiBMA Investment Grade Corporate Bond Index, and Composite Index from the website of Thai Bond Market Association. The deposit interest rates of 1 year for the amount of 1 million baht on the average of 3 banks; Bangkok Bank, Kasikorn Bank, and Siam Commercial Bank, can be observed from the website of the Bank of Thailand, respectively.

This research selects to use the data of 1 year Zero Rate Return Index (ZRR index) as the risk-free rate and Composite Bond Index as Market Return following the methods of study of Rao, Tauni, lqbal, & Umer (2017).

In analyzing the performance persistence of the fixed income funds used in this study has two main objectives. Firstly, it is to study the performance of fixed income funds in comparison with the benchmark. Secondly, it is to study the persistence of the fixed income funds in order to know whether the funds can generate the good returns continually or not. The main approaches used in this study can be divided into 3 parts. **Part 1** is the analysis on the returns of the studied fixed income funds compared to the overall market returns as well as being compared to the Benchmark without considering the risk factors of each fund. **Part 2** is the analysis on the Risk-adjusted Return following the Capital Asset Pricing Model (CAPM). The performance is studied compared to the Benchmark considering the risks factors following the Sharpe's Ratio methodology. **Part 3** is the consideration on the persitence of performance improved from the Winner-Winner, Winner-loser Persistence Test referred following the studying methods of Goetzmann and Ibbotson (1994), Brown and Goetmann (1995), Malkiel (1995), and Droms and Walker (2006).

The first part is the analysis on the returns of fixed income funds compared to the returns of the benchmarks regardless of the risk factors. This research uses 3 main benchmarks based on the Benchmark of the Association of Investment Management Companies (AIMC). This research defines that **Benchmark 1** is the mean between the ThaiBMA Government Bond Total return Index in the proportion of 50% and ThaiBMA Investment Grade Corporate Bond Index in the proportion of 50%. **Benchmark 2** uses the mean between ThaiBMA Government Bond Total return Index of ThaiBMA in the proportion of 50% and the deposit interest rates of 1 year for the amount of 1 million baht on the average of 3 banks; Bangkok Bank, Kasikorn Bank, and Siam Commercial Bank in the proportion of 50%. **Benchmark 3** is the Composite Bond Index which is the index measuring the investment in all types of fixed income funds. That is the index to measure the movement of investment in the fixed income funds for the whole market calculated from the state enterprise bond index guaranteed by Ministry of Finance and non-guaranteed as well as the Corporate Bond Index BBB up. This is used as Market Return. These three Benchmarks are that the mutual funds popularly use as shown in the letter of invitation of each fund as recommended by the Association of Investment Management Companies referred to the approach of study representation as shown in Part 1 following the study method of Sorasat Sukcharoensin and Pariyada Sukcharoensinnatthawut (2013).

For the study in the second part, it is to compare the risk-adjusted return for testing whether each time period of the fixed income fund operation can yield the returns over the benchmark or not when the risk factors have been controlled. Initially, this research utilizes the model that yields the abnormal returns or Alpha that the fund is able to outperform higher than the composite bond index used as the market return after adjusting the risk that the fixed income fund carries. According to theory of Capital Asset Pricing Model (CAPM) which is the popular concept of Sharpe (1964) and Lintner (1965) following the equation:

$R_{it} - R_{ft} = \alpha_i + ß_i(R_{mt} - R_{ft}) + e_{it}$

Whereas R_{it} is the fund return at the time t, R_{ft} is the returns of risk-free securities at the time t, R_{mt} is the market return at the time t, $ß_i$ is the beta coefficient of the fund or the Systematic Risk, α_i (alpha) is the coefficient representing the excessive fund return which is more than the market return, and e_{it} an error term. The value interests us is the alpha coefficient (α = Alpha) which is the return inexplicable with the risks held by such fund. The Alpha is the excessive return which is gained after deducting with the returns compared to the risks (Lintner, 1965; Sharpe, 1964).

The next step is to study the performance of the fixed income fund considering the risks associated with Sharpe's Ratio. It is for finding the difference between the return of the fund and the return of risk-free securities adjusted with the total risk supported by that fund or standard deviation of mutual fund (σ) following the formula

Sharpe Ratio = $(R_p - R_f)/ \sigma_p$

Whereas R_p is the fund return, R_f is the return of risk-free securities and σ_p is the standard deviation of the fund return. If Sharpe Ratio is higher, it will be considered that such fund has higher efficiency in the management as well. It can create the increasing return per one unit of the total Risk. Besides, when calculating to find Sharpe Ratio of each fund in each year and compared to Sharpe Ratio of the market to measure the performance of fixed income fund compared to the total market performance, the Composite Bond Index is defined to represent the market.

The study in the third part is to measure the performance persistence of fixed income fund which is the core in studying the performance persistence of such fund depending on the relationship between the return in the past and the return in the future. Funds exhibiting performance above the benchmark are characterized as winners, while appearing below the benchmark performance are characterized as losers. Persistence is measured by whether winners(losers) in one period remain winners(losers) in the next test period. The funds which are the winners at that period and still become the winners in the next period(winner-winner)will be the Positive Performance Persistence (Good Performance Persistence). The funds are the losers at that period and still become the losers in the next period (loser- loser) will be the Negative Performance Persistence (Poor Performance Persistence) according to the methods of study of Droms and Walkers (2006) and Grose, Dasilas and Alexakis (2014). Moreover, the consideration will be on the continuance of the whole performance of the mutual funds with statistical significance using the t test (t-statistic)

Research Results

The study in the first part and the second part is the study responding the first research objective that is to study the performance of fixed income funds compared to the benchmarks in order to know whether the investment in the fixed income funds can generate the excessive returns compared to the benchmarks or not. The study in the first part is to analyze the returns of the fixed income funds compared to the returns of benchmarks without considering the risk factors as in Table 1 representing the descriptive statistics of the returns of the fixed income funds studied during 2008 - 2017. This research chooses to study the performance of mid-term and long-term fixed income funds following the number of funds as shown in the table.

The number of funds increases gradually from 54 funds in 2008 to 136 funds in 2017. It can be seen that the return of the fixed income funds studied averagely per year is from 1.258% - 4.442%. The maximum return of the fixed income funds is 33.677% in 2009 and the average minimum return is -20.381% in 2008. It is found that in 2009, the fixed income funds have the most fluctuating return reflected from the standard deviation up to 5.023%.

Table 1 Descriptive statistics of the rate of return of the fixed income funds from 2008 - 2017

Year	Number of funds	Mean	Median	Standard deviation	Minimum	Maximum
2008	54	4.44%	3.51%	4.85%	-20.38%	20.75%
2009	72	1.58%	1.09%	5.02%	-6.50%	33.68%
2010	81	1.48%	1.18%	1.58%	-1.38%	9.97%
2011	88	2.45%	2.35%	1.91%	-3.56%	9.61%
2012	97	3.75%	3.00%	3.07%	-0.31%	17.09%
2013	108	1.77%	2.52%	2.44%	-10.47%	4.20%
2014	121	2.85%	2.60%	2.33%	-7.05%	9.55%
2015	126	1.26%	1.91%	2.87%	-16.85%	5.71%
2016	136	1.55%	1.37%	2.68%	-9.41%	12.82%
2017	136	1.75%	1.60%	2.06%	-9.02%	11.16%

According to Figure 1, when considering the performance of the fixed income funds during 2008 - 2017, it is found that over 80% of the mutual funds studied each year gives the positive returns. It is also found that in 2009, there are number of funds giving negative returns up to 18.06% of the total of 72 funds that there are 13 funds giving negative returns.

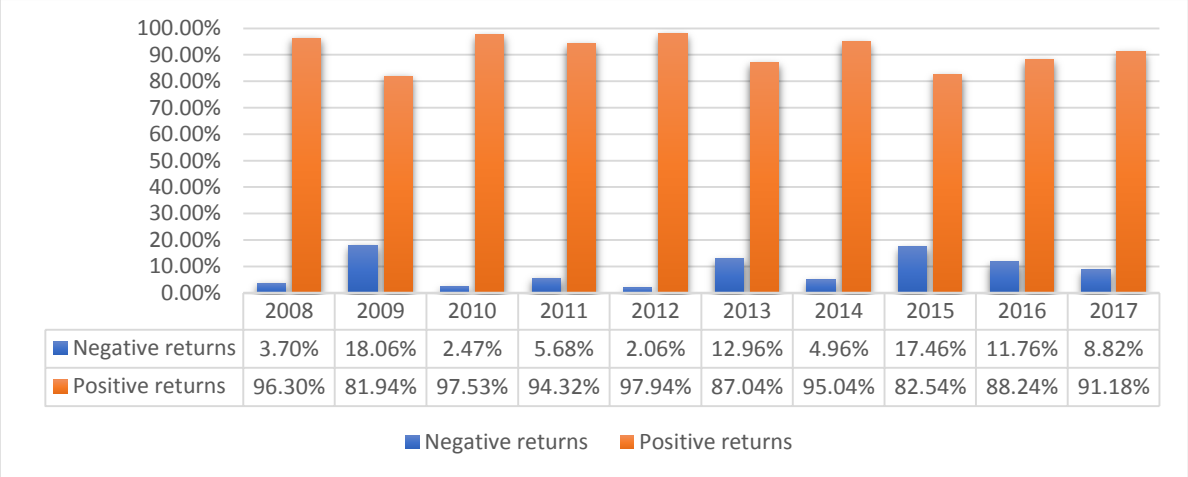


Figure 1 shows the number of funds giving the negative/positive returns during 2008 - 2017

When considering comparing the returns of the fixed income funds averagely per year compared to the Benchmark as shown in **Table 2**; Benchmark 1, Benchmark 2, and Benchmark 3 as defined in the methods of study. According to the Table showing the research results, it is found that wholly the performance of the fixed income funds is lower than the Benchmark and cannot generate the excessive returns. When comparing to Benchmark 1, the Excess returns were negative for up to 9 years. Only in 2009, the Excess returns were positive of 0.51% correspondent with the Excess returns when using Benchmark 2 and Benchmark 3 giving the Excess returns in both positive and negative each year. Besides, it can be noticed that in 2008, the Excess returns were negative at very high level

compared to the Benchmarks. The Excess returns were -6.67% -3.95% and -10.53% according to Benchmarks 1, 2, and 3, respectively. This shows the average returns of the mutual funds have the negative excess returns without being related to the direction of market wholly whether how the market's direction is. This reflects that Thai fixed income funds have the performance poorer than the market averagely. This research gives the study results correspondent with the research of Gallo, Lockwood, & Swanson (1997).

Table 2 represents the returns and the excess returns of the fixed income funds averagely for every fund (% per year) compared to the benchmarks from 2551-2560.

Period	Return of funds (R)	Benchmark 1 (1)	Excess returns (R)-(1)	Benchmark 2 (2)	Excess returns (R)-(2)	Benchmark 3 (3)	Excess returns (R)-(3)
2008	4.44%	11.11%	-6.67%	8.39%	-3.95%	14.97%	-10.53%
2009	1.58%	1.07%	0.51%	-0.50%	2.08%	-1.55%	3.13%
2010	1.48%	4.81%	-3.33%	2.66%	-1.19%	5.43%	-3.96%
2011	2.45%	4.16%	-1.72%	3.36%	-0.92%	5.19%	-2.75%
2012	3.75%	4.17%	-0.42%	3.27%	0.48%	3.64%	0.11%
2013	1.77%	3.28%	-1.51%	2.57%	-0.80%	2.63%	-0.86%
2014	2.85%	6.83%	-3.99%	4.42%	-1.57%	8.47%	-5.62%
2015	1.29%	4.44%	-3.15%	2.76%	-1.47%	4.88%	-3.59%
2016	1.55%	2.03%	-0.48%	1.46%	0.09%	1.52%	0.03%
2017	1.74%	3.69%	-1.95%	2.47%	-0.73%	5.08%	-3.33%

Figure 2 shows the percentage of funds giving the higher/lower returns than the market returns defining the Market's Return as the rates of return of Composite Bond Index. The study results reveal that there are 7 years; 2008, 2010, 2011, 2012, 2014, 2015, and 2017, that over 80% of the total number of fixed income funds gave the returns from the performance lower than the Market's Return. For example, in 2017, it was 96.32% of the total number of studied funds or calculated as 131 funds from 136 funds having the performance lower than the market performance.

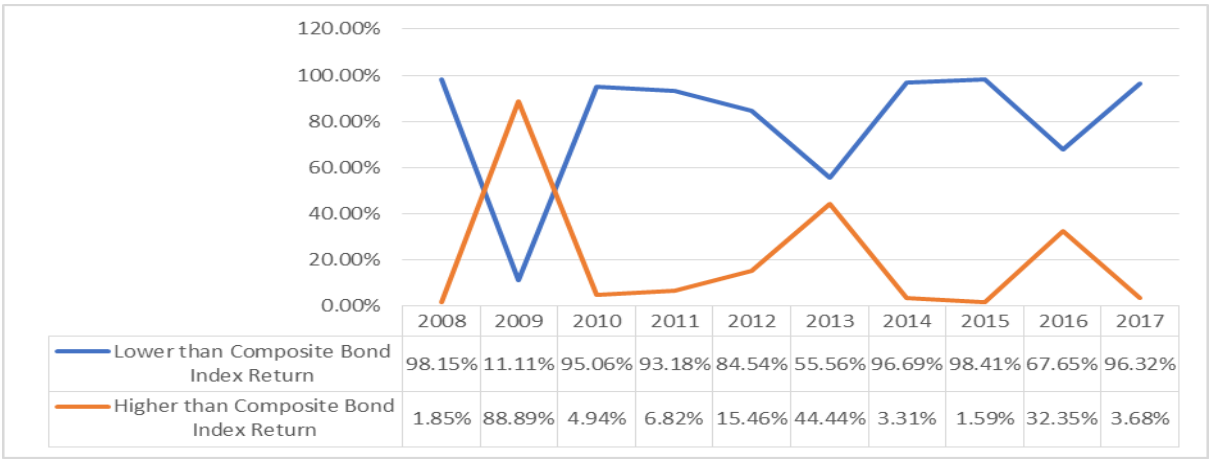
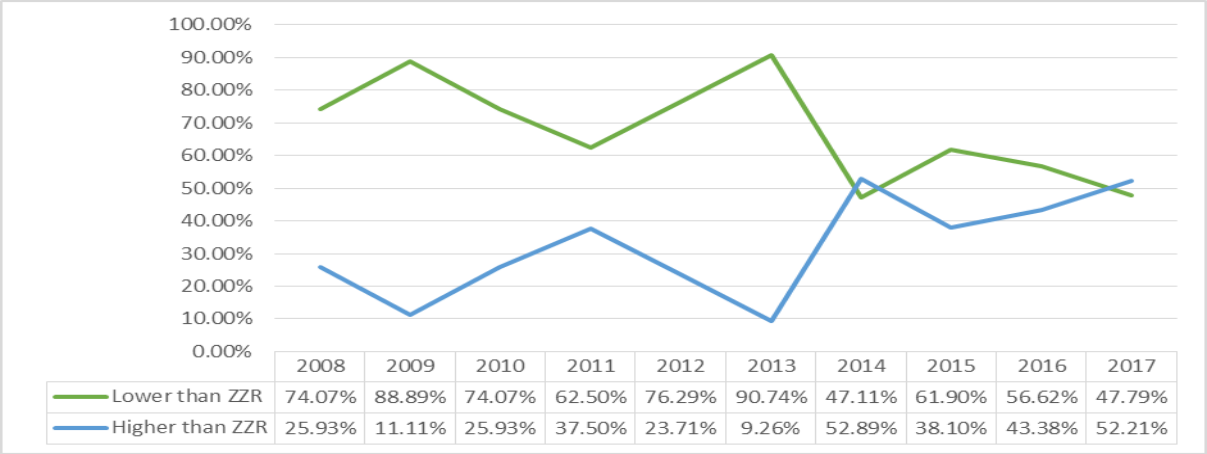


Figure 2 shows the percentage of fixed income funds giving the higher/lower returns than the Market's Return from 2008-2017.

In order to confirm the research results that the performance of fixed income funds is likely to Underperforms, Figure 3 shows the number of fixed income funds giving the higher/lower returns than the risk-free rate (Zero Rate Return Index : ZRR index of 1 year). This is considered the bond possibly giving the lower returns compared to other bonds with the same age following the concept to consider from the returns required by the investors following the level of risks which the investors have to encounter. For any bond having the high risks, the investors need to get the high returns from the investment as well. On the other hand, for any bond having the low risk level, the investors need to get the low returns from the investment (Markowitz Portfolio Theory). However, from Figure 3, it is found that there are 8 years that more than half of the number of fixed income funds gave the returns lower than the risk-free rate reflecting that the fixed income funds managed lower than the target very much.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Lower than ZZR	74.07%	88.89%	74.07%	62.50%	76.29%	90.74%	47.11%	61.90%	56.62%	47.79%
Higher than ZZR	25.93%	11.11%	25.93%	37.50%	23.71%	9.26%	52.89%	38.10%	43.38%	52.21%

Figure 3 shows the percentage of fixed income funds giving the higher/lower returns than the Zero Rate Return Index (ZRR index) which represents the risk-free rate from 2008-2017.

The study in this part is the study in the second part of the research comparing the returns of the funds by considering the Risk-adjusted Return. At the first stage, we calculate to find Alpha following the method of Capital Asset Pricing Model (CAPM) which is the value popularly used for assessing the performance of the funds after the risk adjustment. Alpha is the value showing the abnormal returns or the returns excessive from the Expected Rate of Return. If Alpha is positive, it means such funds can give more performance than as expected or such funds can generate the performance to overcome the market after the risk adjustment. On the other hand, if Alpha is negative, it means such funds can generate the performance defeated by the market performance after the risk adjustment.

Table 3 The table reports the regression results of 136 Thai fixed income funds for the period from 2008-2017 by using CAPM regression equation

Year	Alpha	Beta	Adjusted R Square
2008	0.00007*	0.13751*	0.40783
2009	0.00006*	0.16786*	0.3968
2010	0.00002	0.11043*	0.10412
2011	-0.00005	0.09702	0.00304
2012	0.00011*	0.09623*	0.05762
2013	0.00005*	0.17407*	0.35176
2014	0.00006*	0.09225*	0.05678
2015	0.00004	0.15556*	0.11902

Table 3 (Con.)

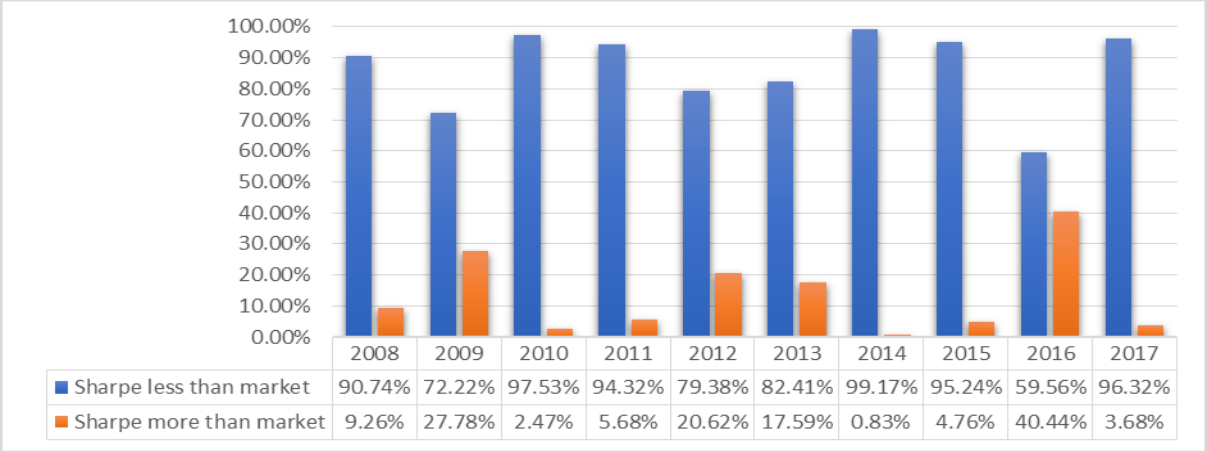
Year	Alpha	Beta	Adjusted R Square
2016	0.00004*	0.07750*	0.0594
2017	0.00003*	0.12170*	0.27744

* With the statistical significance at the confidence level of 95%

Table 3 shows the result of Linear Regression Analysis of CAPM using the data of daily returns of fixed income funds averagely in each year compared to the market returns to represent the competence of fixed income funds in generating the Alpha and Beta following the method of Capital Asset Pricing Model (CAPM) from 2008 - 2017. The research result reveal that the fixed income funds can generate abnormally excessive performance more than the market performance only little after the Systematics Risk adjustment. From considering the research results, it is found that there are 7 years in which the fixed income funds have the positive Alpha after the risk adjustment at the statistical confidence of 95%. That is to say that the fixed income funds can generate better returns than the market. In 2011, the fixed income funds have the negative Alpha significantly that means the fixed income funds can generate the returns lower than what the investors expect following the levels of risk which the investors have to encounter from investing in such funds.

It can be noticed that the fixed income funds have the Beta very lower than the market Beta (market Beta is 1). This means the fixed income funds have low Systematic Risk that is possibly because the fixed income funds usually have low fluctuating Net Asset Value compared to the change in the value of the bonds in the market. This is possibly because the competence in the valuation of value of the bonds in the market of the Investment Management Companies of such funds are not correspondent with the reality as the bonds because of very low liquidity in trading and the trade in the secondary market is usually done through OTC (Over the Counter) mainly. The value of the bonds can be assessed to find the closing price at the end of the day difficultly affecting the net asset value of such funds directly.

Moreover, in the second part, it will consider the rates of return with the Benchmark in another form using the Sharpe Ratio as the main instrument in measuring the performance of the mutual funds. The research results as in Figure 4 represent the number of fixed income funds having the performance representing by Sharpe Ratio compared to the market performance per one unit of risks whether the fixed income funds have the Sharpe Ratio higher or lower than the market performance. The study reveals that over 90% of the total number of fixed income funds in 2008, 2010, 2011, 2014, 2015, and 2017 have the performance showing by Sharpe Ratio lower than the market performance. This is correspondent with previous study measuring the performance of the funds without considering the risks in supplementary.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Sharpe less than market	90.74%	72.22%	97.53%	94.32%	79.38%	82.41%	99.17%	95.24%	59.56%	96.32%
Sharpe more than market	9.26%	27.78%	2.47%	5.68%	20.62%	17.59%	0.83%	4.76%	40.44%	3.68%

Figure 4 shows the percentage of fixed income funds having the higher/lower Sharpe Ratio than the Sharpe Ratio of Composite Bond Index which represents the market from 2008-2017.

The third part is the study to answer the second research objective in considering the persistence of performance of fixed income funds by improving from Winner-Winner, Winner-loser Persistence Test referred following the method of study of Droms and Walker (2006) and Grose, Dasilas and Alexakis (2014) for testing the Hot Hand phenomenon that if the funds can create the good performance at the period in the past, the funds can create the good performance in the future as well. The test on the performance persistence of the fund is to create the two-way table for studying which fund is the winner at the time t and still has the performance higher than being the winner at the time t+1 such funds are considered to have Positive Performance Persistence and which funds are the loser at the time t which is still the loser at the time t+1 such funds will be considered having Negative Performance Persistence. Table 4 represents the results of studying the performance persistence of fixed income funds. In this part of the research, 2 Benchmarks are used; mean of fixed income funds and performance following the Sharpe Ratio by defining the Composite Bond Index as the market performance. The level of statistical significance is measured by using t-statistics. The research result reveals that during 2010-2011, there is no fixed income fund that can maintain the good performance significantly when the Benchmark is the mean of returns of the fixed income funds. However, there are the funds with negative performance persistence for 66.67% of the total funds with significance at the confidence level of 99%. However, when considering with the Benchmark which is the market performance following the Sharpe Ratio. It can be noticed that the number of fixed income funds which are Winner-Winner have the persistence of 0% - 70% of the total funds. There are the number of funds which are Loser-Loser having the persistence of 50% - 90% of the total funds. This represents that most fixed income funds can maintain the performance persistence in the management of poor funds (negative performance funds)better than the competence in the management of good funds (positive performance funds). When the poor performance funds in any year in the past, it is likely to have the Poor Performance Persistence in the next year as well.

Therefore, entirely, the research results from Table 4 indicates that the performance of the fixed income funds has the persistence at the low to medium levels. The performance of the funds in each year can indicate or can be used for predicting the likeliness of performance in the following years quite little. The fixed income funds having the good performance (winner)in the past the investors cannot expect that such funds can have the good performance continually in the short term in the future.

Table 4 represents the performance persistence of fixed income funds by analyzing the two-way table with the benchmarks. The numbers shown in the Table are the percentages of funds with the performance in the year t and continually to the year t+1 of winner-winner winner-loser loser-winner and loser-loser from 2008-2017. There is the test with the statistical significance using t test (t-scores).

Periods		**Performance of the funds**				
		compare with mean return			**compare with Sharpe ratio of the market**	
		winner	**loser**		**winner**	**loser**
2008-2009	winner	15.00%	85.00%	winner	0.00%	100.00%
	loser	8.82%	91.18%	loser	20.41%	79.59%
2009-2010	winner	75.00%	25.00%	winner	28.57%	71.43%
	loser	12.50%	87.50%	loser	1.96%	98.04%
2010-2011**	winner	0.00%	100.00%	winner	28.57%	71.43%
	loser	33.33%	66.67%	loser	9.46%	90.54%
2011-2012*	winner	26.47%	73.53%	winner	45.45%	54.55%
	loser	9.26%	90.74%	loser	11.69%	88.31%
2012-2013	winner	60.00%	40.00%	winner	41.18%	58.82%
	loser	87.80%	12.20%	loser	10.00%	90.00%
2013-2014**	winner	44.83%	55.17%	winner	41.18%	58.82%
	loser	33.33%	66.67%	loser	31.87%	68.13%
2014-2015**	winner	90.38%	9.62%	winner	29.27%	70.73%
	loser	71.01%	28.99%	loser	2.50%	97.50%
2015-2016	winner	26.26%	73.74%	winner	73.33%	26.67%
	loser	33.33%	66.67%	loser	30.63%	69.37%
2016-2017	winner	76.19%	23.81%	winner	14.81%	85.19%
	loser	28.72%	71.28%	loser	3.66%	96.34%

* Representing the statistical significance at the confidence level of 95%
** Representing the statistical significance at the confidence level of 99%

Conclusion

This research is on the performance and the maintenance of performance persistence of fixed income funds in the mid-term and long-term in Thailand for 54-136 funds in each year since 2008-2017 to shows the empirical research study how the returns gained by the investors from the investment in the mutual funds are compared to the direct investment in the bond market. The results of this research can confirm the results of most researches studying the fixed income funds in the foreign countries that the fixed income funds cannot generate the performance overcoming the market and the benchmark defines the case compared to returns before the risk adjustment. However, when calculating the excessive returns (Alpha) following Capital Asset Pricing Model (CAPM), the research results reveal that the fixed income funds can generate the returns more than the rate of return expected by the investors only little. When studying the Sharpe Ratio of most studied fixed income funds, they cannot generate the performance overcoming the market as well. This can be represented from the number of funds giving the returns after the risk adjustment following the Sharpe Ratio. It is found that in the duration of 6 years in 10 studied years, there are the fixed income funds of

over 90% of the total number of funds studied and giving the returns lower than the market returns.

In term of the study on the performance persistence of the fixed income funds, this study uses the Winner-Winner, Winner-loser Persistence Test following the study methods of Droms and Walker (2006) and Grose, Dasilas and Alexakis (2014) using the mean and the Sharpe Ratio of Composite Bond Index as the Benchmarks. The research results reveal that the performance of fixed income funds have the persistence in the low to medium levels and having the funds with Negative Performance Persistence(Poor Performance Persistence) more than the number of funds with Positive Performance Persistence (Good Performance Persistence) clearly. There are 8 durations in the studied 9 durations with poor performance funds for more than the number of good performance funds continually when using the Sharpe Ratio as the benchmarks. The performance of the funds in any year cannot indicate or predict the likeliness of performance in the following year clearly. This is correspondent with the Cold Hand phenomenon stating that for the Winner in the past, the investors cannot expect that such funds would have the good performance continually for the short term (1 year) in the future. From the study of this research, it can represent the competence in maintaining the performance persistence of the fixed income funds in the period of 2 consecutive years. Thus, it is interesting whether the fixed income funds can maintain the performance persistence in the period of 6 months, 1 year or the long term of 5 years or not. This is the good chance to further studying in the future.

As this research collects the performance of the fixed income funds from the funds operated in 2008 and were still operated in 2017 without considering the funds being cancelled or merged with other funds in the analysis of persistence. This possibly causes the problem of "Survivorship Bias". The problems of consideration on the funds especially for the funds being successful or being operated. This possibly causes the research results not to reflect the persistence in generating the actual returns of the fixed income funds in Thailand. Thus, in the future, if the data of investment unit in the past of the funds being canceled is considered altogether, the problem of Survivorship Bias can be prevented following the concepts of Malkial (1995) and Droms and Walker (2006).

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